

We claim:

1. A radiator comprising:

a radiator core defining a front and a rear face thereof and including a plurality of generally rectangular shaped tubes interleaved with layers of fins for passage of air through said core; and

a collecting tank attached to said core in a fluid tight manner to provide fluid communication between said tubes and said collecting tank;

said tubes each having a pair of side walls extending through said core and joined by end walls at said front and rear faces of said core;

said tubes each terminating at one end thereof in a formed segment wherein said end walls of each tube are bifurcated for a distance from said one end of the tube, with said bifurcation terminating in a rounded end of said bifurcation at said distance from said one end, and one of said side walls is adapted to contact a side wall of an adjacent tube in the core;

said adapted side wall being joined in a fluid tight manner to said contacted side wall of said adjacent tube;

said collecting tank having walls thereof extending over said front and rear faces of said core past said bifurcation of said end walls and joined in a fluid tight manner to said end walls of said tubes along and beyond said bifurcation to thereby form a fluid tight joint between said walls of said collecting tank and said end walls of said tubes.

2. The radiator of claim 1 wherein both side walls are adapted to contact an adjacent tube.

3. The radiator of claim 1 wherein said bifurcation is formed by a slot opening at said one end of said tube and having sides spaced by a slot width joined at said distance from one end by a smooth curve forming said rounded end of said bifurcation.

4. The radiator of claim 1 wherein said end walls include a slit of negligible width in said formed segment opening to the end of the tube to bifurcate said end wall in said formed segment, and said slit terminates at said distance from said end of the tube in a circular hole having a diameter larger than said negligible width of said slit.

5. The radiator of claim 1 wherein said side wall of said tube includes a longitudinal rib which is removed from a flattened portion of said adapted side wall by compressing said flattened portion in a constrained manner such that material in said rib flows out of said flattened portion and partially into said end walls of said tube, to thereby provide flat joining surfaces of said adapted side wall and said end walls to facilitate joining said adapted side wall in a fluid tight manner to said contacted side wall of said adjacent tube and joining said collecting tank having walls to said end walls and joined in a fluid tight manner.

6. The radiator of claim 1 wherein said adapted side wall being is attached to said contacted side wall by a compression bond in addition to being joined in said fluid tight manner to said contacted side wall of said adjacent tube.

7. The radiator of claim 1 wherein said end walls are bifurcated in an asymmetrical manner with respect to said side walls with a larger portion of said bifurcated end wall joined to a first one of said side walls, and a smaller portion of said bifurcated end wall joined to the second side wall of said tube, and only said second side wall being adapted and joined to said contacted side wall of said adjacent tube.

8. A radiator comprising:
a radiator core defining a front and a rear face thereof and including a plurality of generally rectangular shaped tubes interleaved with layers of fins for passage of air through said core; and

a collecting tank attached to said core in a fluid tight manner to provide fluid
6 communication between said tubes and said collecting tank;

said tubes each having a first and a second side wall extending through said core
8 and joined by end walls at said front and rear faces of said core;

said tubes each terminating at one end thereof in a formed segment wherein said
10 end walls of each tube include a first bifurcation for a first distance from said one end of the
tube, and a second bifurcation for a second distance from said one end of the tube, with a
12 first portion of said end wall joined for said first distance only to said first side wall, a second
portion of said end wall joined for said second distance only to said second side wall, and
14 a central portion of said end wall not joined to either said first and second portions of said
end wall for said first and second distances respectively;

said first and second side walls are adapted to contact a side wall of an adjacent tube
16 in the core;

said adapted side wall being joined in a fluid tight manner to said contacted side wall
18 of said adjacent tube;

said collecting tank having walls thereof extending over said front and rear faces of
20 said core past said first and second bifurcations of said end walls and joined in a fluid tight
manner to said end walls of said tubes along and beyond said first and second bifurcations
22 to thereby form a fluid tight joint between said walls of said collecting tank and said end
24 walls of said tubes.

9. The radiator of claim 8 wherein at least one of the first and second bifurcations
2 terminate in a smooth curve.

10. The radiator of claim 8 the first and second distances are equal.

11. A method for fabricating a header-less radiator comprising:

2 fabricating a plurality of tubes, each having a generally rectangular cross section
comprised of a pair of spaced side walls joined by a pair of end walls;

4 adapting one end of each of said tubes to provide a formed segment having said end
walls bifurcated for a distance from said one end and at least one side wall in
6 said formed segment adapted to contact and seal against a side wall of an
adjacent one of said tubes when said tubes are joined together in an
8 interleaved configuration with layers of fin to form a radiator core, said
bifurcation terminating in a smooth curve at said distance from said one end
10 of the tubes;

assembling a radiator core in a manner defining a front and a rear face thereof and
12 including said plurality of generally rectangular shaped tubes interleaved with
layers of fins for passage of air through said core; said side walls of said
14 tubes extending through said core with said end walls at said front and rear
faces of said core; and with said adapted side walls in said formed segments
16 of said tubes contacting a side wall of an adjacent tube in the core;

18 joining each said adapted side wall in said formed segments in a fluid tight manner
to said contacted side wall of said adjacent tube;

20 attaching a collecting tank having walls thereof extending over said front and rear
faces of said core past said bifurcation of said end walls; and

22 joining said collecting tank in a fluid tight manner to said end walls of said tubes
along and beyond said bifurcation to thereby form a fluid tight joint between
said walls of said collecting tank and said end walls of said tubes.

12. The method of claim 11 wherein the step of adapting one end of each of said
2 tubes is carried out after assembling said radiator core.

13. The method of claim 12 wherein the step of adapting includes forming at least
2 one of said side walls in said formed segment at said one end of said tubes to contact a
side wall of an adjacent tube in said core by inserting a forming tool into said one end of
4 each of said plurality of tubes.

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